Single Field Universe

by Michael Griffin,

BA Mathematics

Revised and expanded, including the two updates.

Contact email: mdgphx@yahoo.com

Summary: An algebraic basis for a unified field theory using Euler's equation to describe enfielding, and field ranges limited by a principle of conservation of the velocity of light. The hierarchy of forces is from the ratio of Euler spins between two particles.

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A Universe a Single Field Can Play In

Abstract

Features are presented to fit a single-field version for a unified field theory, based upon Euler's equation as the hidden variable to model enfielding of energy into matter.
The spin values and their range spectrum are derived to fit estimates for the different magnitudes of gravity and electromagnetism. Features of Maxwell's equations on a larger scale are considered. Spin enfielding is further interpreted and the Hertz electromagnetic spectrum is recognized. Force constants and a different simultaneity principle are suggested. The contact point with general relativity is considered as the gravitational constant. A conservation principle for total velocities is also proposed.

1. A Universe Needed

A single UFT force

Let us recall that basic truth written as E=MC^2 or E equals MC squared.This is called the principle of mass-energy equivalence. Let's go beyond that and make it into a principle of equality. So how can energy and matter be two forms of the same thing? Since this article is merely speculation, a mathematical recreation, we will only occasionally be bound by the rigorous constraints of known physics. We can form a new interpretation of space-time (st) intended for compatibility with as many basic principles that fit. For classic unified field theory (UFT), we are concerned with the four basic forces of gravity, electromagnetism, nuclear binding, and radioactivity, to spin it into theory.

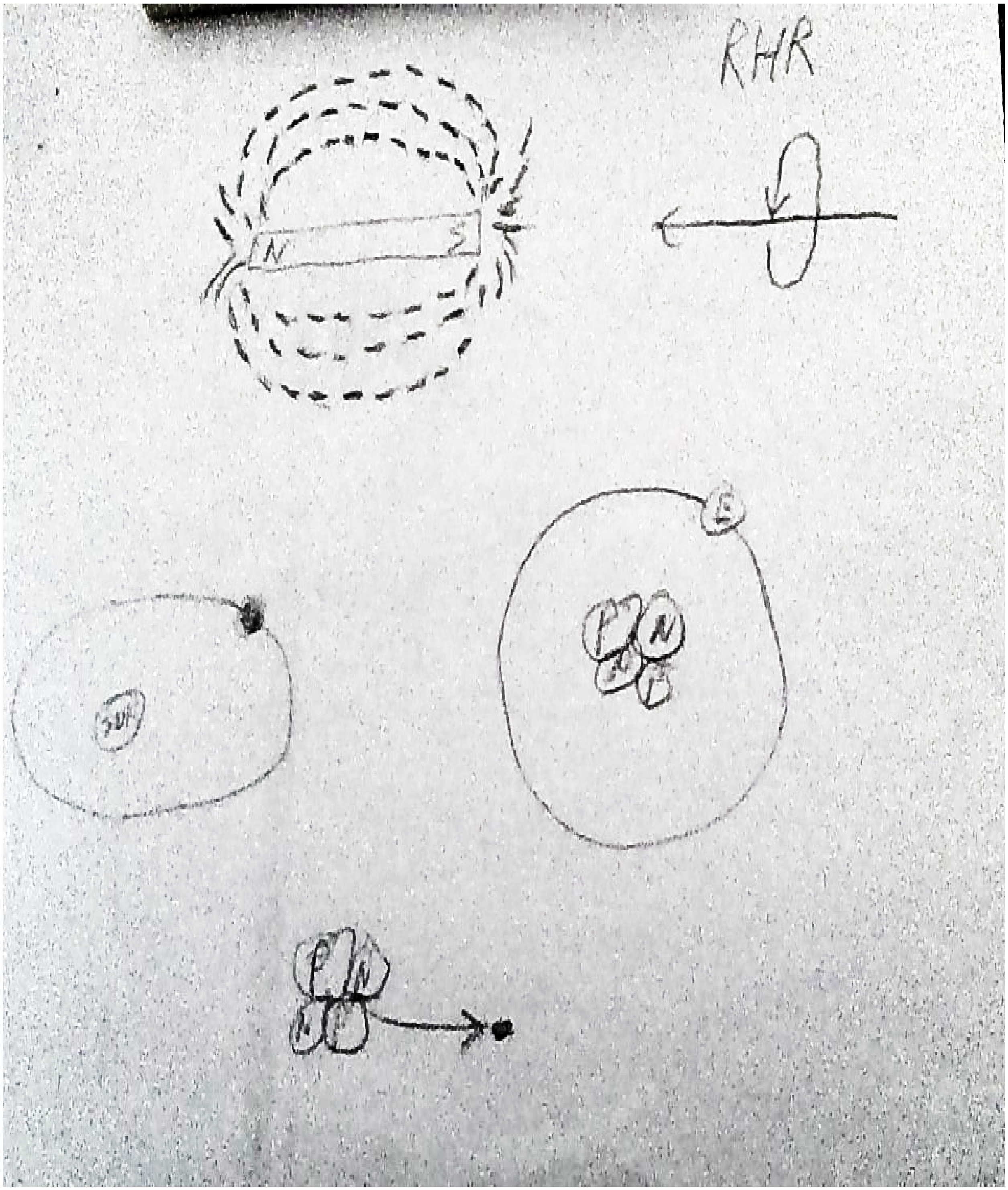

Figure 0

Covering the 4 forces

Each of these forces is illustrated by one idea. Gravity is represented by a planet in space. Nuclear binding and radioactivity are illustrated by, in the nucleus of the atom, protons are bound together in spite of their repelling electric charges. The nucleus can also discharge particles or radiation, radioactivity, which would be going away from the nucleus.

An actual illustration of electromagnetism would have dotted lines to show the magnetic field (fig. 0). Electric current flow lines up electrons, or if a bar magnet has the electrons lined up in the same orientation, the effect is the same as current flow, to create a field. We could take the direction of current flow as fitting the “right hand rule” of a field curving around like fingers curled up behind the right hand’s pointing thumb.

2. Action Principles

Speed-field relation

Electromagnetism is also modeled as the electromagnetic wave spectrum, which also is modeled with particle properties. A particle of light is called the photon, typically considered as energy without mass. The constant speed of light, c, in all frames of reference led to the theory of special relativity. General relativity models the curvature of space and time by gravity from mass. One way it was confirmed is by observing the bending of light rays near the sun. Massless photons with no field of their own are still affected by a gravity field just because space itself is curved. If something is mass, it can never reach the speed of light, according to relativity.

For our UFT substance, we will not make a sharp distinction between mass and energy. Instead, we will compare fields and particle speeds:

	Speed	Field range
Photon	c	0
Weak nuclear	?	10^-17m
Strong nuclear	?	10^-15m
Electromagnetic charge on a mass	Current flow	observable
Gravity mass	Inertia or g acceleration	interstellar

Table 1: Speed and Fields

It seems there is an inverse relation between speed and field. A slower speed has a bigger field.

What is a field? Definition

A field is an area where force or some other quality manifests. We will address the aspects of speed, range, intensity, force, and momentum to derive a UFT. Begin with E=MC^2 or E equals MC squared, or energy equals mass times the speed of light times the speed of light. This is a kind of statement of the ultimate potential energy in mass. Dividing both sides of the equation by the speed of light, we now have E/C=MC. This is a momentum field of mass times the speed of light. Here we depart from relativity theory because in real-world physics this is supposed to be impossible. So our UFT's mass M is not yet matter in the conventional sense. If it is really moving at the speed of light C then it is a photon. It can be modeled as an electromagnetic force, but it does not have the force fields of matter like gravity, binding, or radiation. It moves in a straight path as energy, whereas all the fields of matter would confine it to a local area. To become fielded as matter, its straight line path must change.

Enfielding by Euler's

There is a mathematical symbol which is interpreted in physics to mean rotate 90°. It is the letter i which also stands for the square root of negative one, √-1. This is part of Euler's famous equation e to the pi i plus1 equals zero: $e^{(\pi i)} + 1=0$ or $e^{(\pi i)} = -1$. The symbol pi or π is defined as the ratio of the circumference to the diameter of a circle, and Euler's equation can be interpreted as a way to describe cyclical patterns. If a straight path photon of energy begins a 90° or 90-degree rotation from the diameter of the circle to move along the circumference we can say that it has become enfielded into matter (fig. 1).

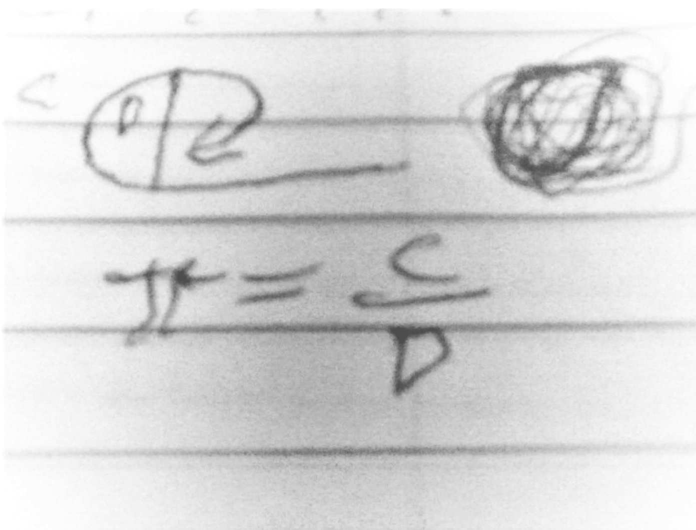

Figure 1

This is one way to interpret the meaning of i. Another interpretation of Euler's equation is that $e^{(xi)} = \cos(x) + i\cdot\sin(x)$. Which again would be the cosine wave in the real world plane and a sine wave in the 90-degree imaginary i-plane. However, when x is pi this cyclical wave motion is also just equal to -1 which could mean the opposite direction that a photon was moving in before it became enfielded and took an orbit at a right angle (fig. 2). So then Euler's equation would be a multiplying factor in the UFT formula.

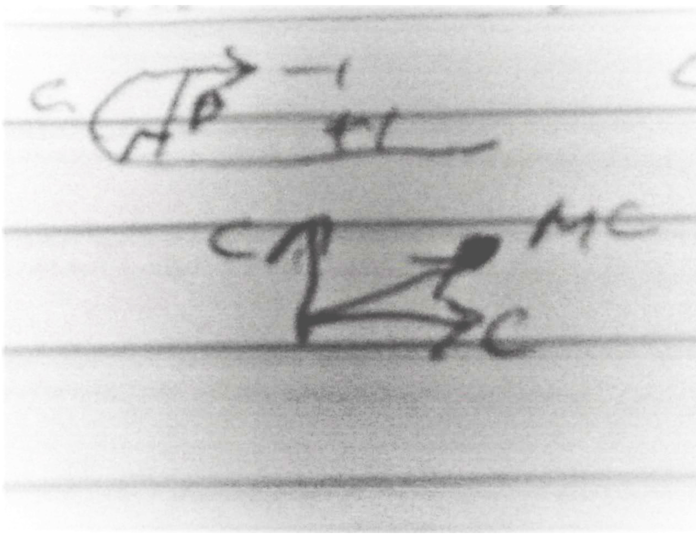

Figure 2

This explains the how but not the why of enfielding. It would also explain the how of the reverse process of unfielding where a matter particle or wave stops harmonizing in it's self-contained area and resumes a straight path as a photon vibrating with its wave-like properties. Something of the why may be due to the +/ - nature of the direction of the equation which was defined as one. When two UFT particles collide we will take that to be the final multiplication of their masses, and we will only consider the directional value of +/-1. Positive one has been defined as the path of a photon while -1 has been defined as the path of enfielded mass. A few basic possibilities exist:

-1 X -1 = +1 two masses collide and convert to photons,

-1 X 1 = -1 mass absorbs a photon,

1 X 1 = 1 photons collide and merge or remain photons.

Those would be the rules according to basic arithmetic. The other possibilities which would not conform to standard arithmetic are:

1 X 1 = -1 photons collide and emit a mass,

-1 X 1 = +1 mass absorbs a photon and converts to photon,

-1 X -1 = -1 two masses collide and remain mass.

For the UFT the basic rules can suffice. The other rules may apply if something else like the Euler field factor makes a better fit to reality.

Space-time (st) defined as MC

So our particle of UFT material has now become fielded mass and is no longer moving at the speed of light C. Then what was the meaning of a potential momentum field MC? This is the ultimate momentum from the ultimate energy that any mass can have. For conservation of energy, this is the structure of (st). In any inertial frame of reference, a particle's total momentum is MC merely due to its existence in (st). A Cartesian-like grid would have the X and Y axes represented each by a C vector, meaning the speed of light:

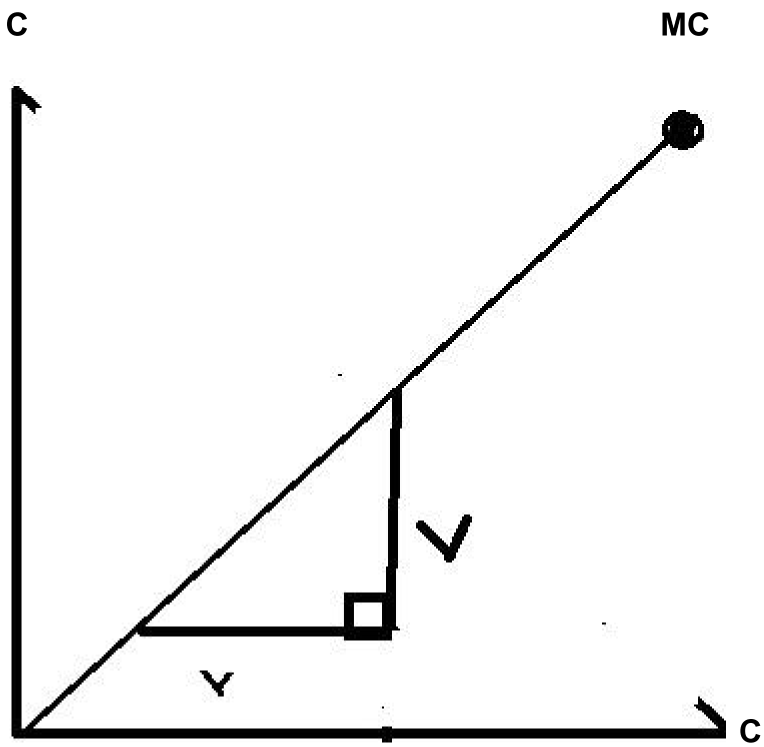

Figure 3

Note that area is two dimensions or C squared, as in E=MC^2. This can be interpreted as the three-dimensional aspects of the grid, and the two dimensional plane of C squared would be analogous to the curl of the field while one-dimensional vector momentum is analogous to the divergence of the field. MC is the (st) tension that any particle has. Left on its own, that particle can move along the grid as a photon or other energy particle.

What of the inverse relation between speed and field? A particle at slower speed has a bigger field. A ratio V/C that appears in relativity theory also makes sense to modify the momentum field E/C=MC since the momentum of physical objects is MV not MC. To maintain the original balance of the relation, we have E/(V/C) =MV/C. The left side of this equation will become bigger as the velocity becomes smaller. So we can call the ratio V/C a measure of the field intensity. Since our basic structure of (st) is MC, a measure of the range ratio R of any field could be defined so that RV= C. Then range ratio times intensity is R X V/C = C/C = 1. A photon with velocity C has field intensity one to begin with, and a range of one, which would mean the diameter of the photon

itself with an exterior field of zero. Since R = C/V there is now some justification for the traditional Infinity postulates of fields: as V approaches 0 the range factor approaches Infinity for that special frame of reference.

Look at the above diagram (fig.3) of the path of MC in a CXC grid. Using the Pythagorean theorem, break Its C vector into its right-angle velocity components v and V:

v^2 + V^2 = C^2   v^2 = C^2 - V^2   v^2/C^2 = C^2/C^2 - V^2/C^2

v^2/C^2 = 1 - V^2/C^2   so   v/C = $\sqrt{1 - \frac{V^2}{C^2}}$ and if Rv = C then R = C/v

But C/v = 1/(v/C) which = $1/\sqrt{1 - \frac{V^2}{C^2}}$ which is the Lorentz transform factor (Ltf) so the range factor R of v = the Ltf of its co-component V. The velocity components v and V come from the enfielding of mass M (fig. 4). Special relativity's Ltf is generated here by the mass distortion of (st), providing a structural basis for relativity.

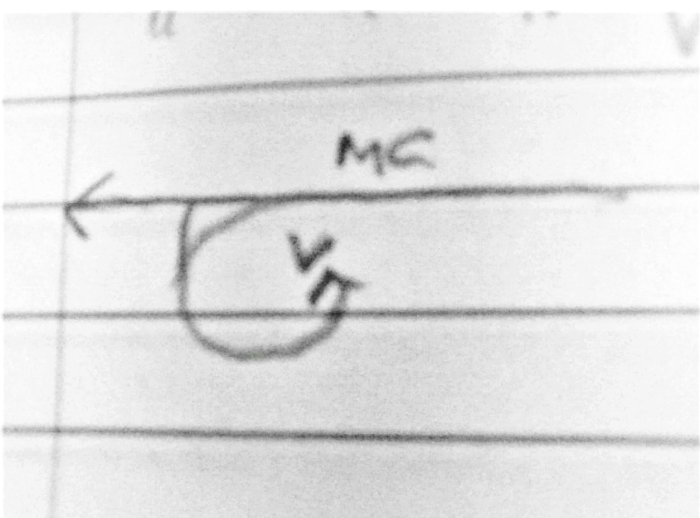

Figure 4

3. A Universe Compared

Scale of forces

The following table is revised from a standard textbook cited in the sources:

Force	relative strength	range
Strong nuclear	1	10^-15m
Electromagnetic	10^-2	oo
Weak nuclear	10^-13	10^-17m
Gravitation	10^-38	oo

Table 2: Forces

Gravity thus 1/10,000

The table uses the Strong nuclear force as a unit of one since it is the strongest. The relative strengths of the other forces in the table are compared to that. One implication from the table is that gravity is also not really an infinite range. We see that gravity is less than the strong force by a factor of 10 to the -38 power. If there is an inverse relation between speed and field, then it may also show up between strength and range. We may thus conclude that the range of a gravity field is greater than a strong field by the factor of 10 to the 38th power. Multiplying these two factors means that we combine the exponents to get the range of a gravity field as: 10^-15m X 10^38 = 10^23 meters.

We can compare this result to the known size of the universe, 8.8 X 10^26 meters. Rounding this up to 10^27m we see that the universe is about 10^4 or 10,000 times bigger than the extent of a single gravity field. Our galaxy is said to be only 5X10^20m across, which is well contained within any single gravity field. A galaxy may only affect 1/10,000 of the rest of the universe, with its gravity. This may explain so many astronomical observations which at present do not fit any theories.

So in the table, both gravity and electromagnetism carry a definition that their ranges are infinite. I would call this an infinity postulate. In the UFT there is a new infinity postulate that the (st) tension of a particle everywhere is MC. The old infinity postulate is not used. Unfortunately, our formula for the range of field based on velocity does not give an easy answer for gravity's field as 10^23 meters. For example, a single g of earth acceleration due to gravity for one second gives about 10 m/s velocity. The speed of light C is 3×10^8 m/s. From that, the gravity range of an earth particle would be only 10^7 m. If we multiplied masses in Newton's formula, perhaps we could add exponents to get 10^14. Now the gravitational constant G has a power of 10^-11. If this were inverted and the exponent was added, then we would get 10^25 meters.

This implies an alternative range formula when considering paired velocities:

R_1R_2 / G = range

Later results for weak and strong particle speeds support the use of this formula.

What does not support this formula are the unit labels on the gravitational constant G and also the range ratio factors R. We can only take the number values from G instead of its labels. If we treat the range factors like a 1-second snapshot then there is some support for using them as actual distance values and not just dimensionless ratios, since time times velocity equals distance.

Spin cycles for field strength

If we subtract exponents in the above table we see that electromagnetism is 10 to the 36th power stronger than gravity, or 10^36. The two forces have different inverse square laws, one based on charge Q and the other based on mass M. Our UFT field should

only have a single inverse square law. Besides that law, it also has the new Euler factor e^(nπi) where the exponent n pi i allows for many cyclical waves or spins represented by the letter n. If each enfielded mass has its own Euler factor and two masses multiply in such an inverse square, then at the very least it would be e^(2πi) which would revert to a direction of +1 if it were still photons, but it is not. Instead for two enfielded masses the system has them spinning or cycling at some value of e^(nπi).

The value of n may be the only difference in field strengths. For comparison, let us say that n equals 1 for the gravity field G and we don't know the value of n for the electromagnetic field Q. We do know that the ratio or fraction Q/G equals 10^36. All other field formulas in the fraction have canceled out leaving only:

e^(nπi) / e^(πi) = 10^36. This simplifies to e^((n-1)πi) = 10^36. Solving for n we get:

n = (36 ln10) / (πi) + 1 as how many more cycles or spins the enfielded particle had to make to go from gravity to electromagnetic strength. In this context if we treat the i as just one then the value of n is 27.4 or about 27 and a half spins. Similar calculation results for strong and weak forces will appear in a table below.

So whatever the actual number of spins, one mass or charge is spinning 27.4 more times than the other one to make the force between them of electromagnetic strength. The relative spin value is an index of angular speed or frequency. And it is not a problem for different masses to have the same amount of charge force, like a proton and an electron.

Inertia, where is +/- always

The value of n may also determine where is a +/- polarity in the UFT field, which is always seen in Q but never recognized in gravity's G. Consider two curves extended into complete circles side by side: a OO pattern. This could represent the spinning (st) cycles of two enfielded masses. General relativity would make this out to be the (st) funnels of mass without any spin. By spin I refer to the n value of the Euler field factor. If the spins are in the same direction they have the same sign whether +/+ or -/-.

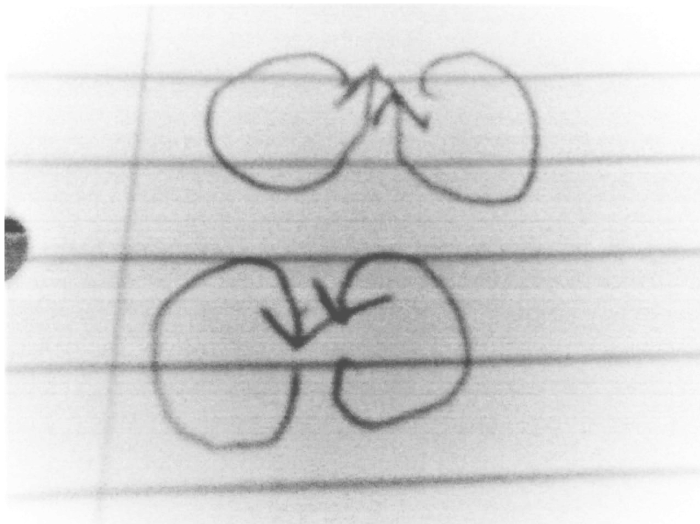

Figure 5

If the spins are in the opposite direction they have different signs whether +/- or -/+, and the circular paths will come around to go through the middle of the OO shape in the same direction. This is opposite signs attracting in (st). If the spins are in the same direction and get out of sync the paths will collide in the middle of the OO, opposing each other in reverse direction. This is repulsion of the same signs whether +/+ or -/-.

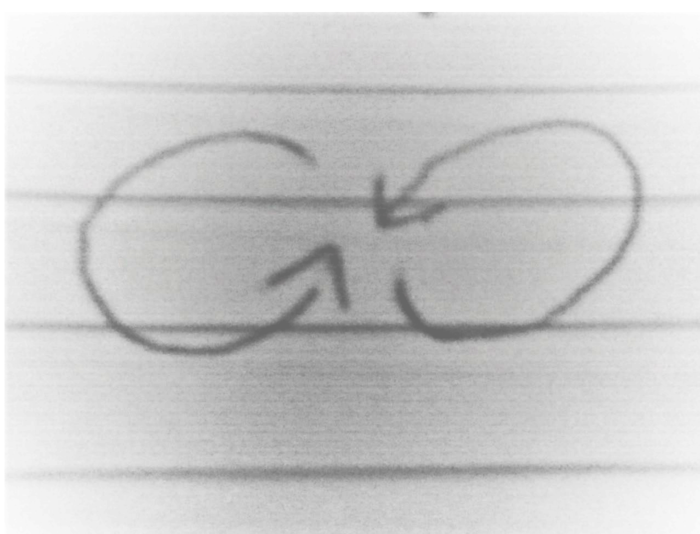

Figure 6

What of the neutral charge, which can show up on a neutron that may split into a +/- proton and electron? Where does the spin go for a fielded yet neutral mass? On a two-dimensional figure, the spin may shift off of the diagram into the third dimension, losing its mutual or opposite flow to a 2-d spin path. This then raises the prospect of neutrons and antineutrons in their own +/- plane of action.

And how much is any spinning particle solid, or it may be a swirling aggregate of enfielded photons which have resolved into a mutual direction to give a definite +/-/0 charge.

The question remains, where is repulsion with the force of gravity? All around us we see everything attracted with gravity as if everything has opposite +/- polarities. Part of the answer may be in an anthropic principle: If the anti-gravity were not already gone we would not be here to notice. There are suggestions that galaxies are separating at an accelerating rate, and this would clearly be due to repulsion of their net gravitational fields. The cosmological constant of general relativity may then be an index of anti-gravity repulsion.

On an everyday level, where else could anti-gravity repulsion show up? Modeling gravitational motion occurs in two dimensions, one in the direction of attraction and the other at an inertial right angle. Inertia is plain velocity not acceleration so it is a momentum not a force. The momentum that keeps two masses moving away from each other or towards each other as the case may be. Maybe sometimes inertia is from the force of repulsion. In a broader inertial frame of reference where special relativity would apply, but too local for general relativity, anti-gravity only happens on a gravity scale. In a UFT there is only one kind of repulsion: when n values get out of sync.

Radioactivity-binding +/-

We can now fill in the missing velocities in our first table above for the strong and weak nuclear forces. Use the field definition of range times velocity equals c, or R X V = C.

For the strong nuclear force, its range is 10^-15m while the speed of light C is 3 X 10^8 m/sec. V would have to be 10^23 for the exponents to work, which is impossible for a single particle, but we have two particles multiplying in the inverse-square relation. As was done with the gravity example above, we will also consider the gravitational constant with its exponential power of 10^11. So from an exponent of 23 we subtract 11 and then divide by 2 leaving 23-11 = 12 / 2 = 6 for the exponent. So the revealed mass particle velocity in a field of nuclear binding strength is 10^6 m/sec.

Similarly for the weak nuclear force, its range is 10^-17m. To get a light speed C value of 10^8 m/sec, V would have to be 10^25 for the exponents to work. Again we subtract the gravitational constant's power and divide the result by 2 since two particles are multiplying their fields together. 25-11 = 14 / 2 = 7 so the revealed particle velocity involved in the weak force is 10^7 m/sec. Weak forces emit particles and gamma rays, so regardless of electromagnetic charge there is still a repulsion occurring due to out-of-sync spin-cycle values of n.

The usual way binding force is thought of, is so the binding force is assumed to overcome the like-charge repulsion of protons. If there is only a single binding inverse-square force then this is no longer the case.However, if experiment does show that such amounts of energy are involved in the nucleus then it makes sense to keep these relative magnitudes of forces to make the tables for this UFT.

4. Forces and Spins Compared

Use of Euler Field Factors

As per the drawing (fig. 7), Euler's equation e to the pi i plus 1 equals zero: e^(πi) + 1= 0 or e^(πi) = –1, can model the reverse direction of a photon as it is enfielded into spinning matter. This can have the number of spins n as a hidden variable to make the Euler field factor e^(nπi). To go from the level of a single photon to a mass particle or charge, then the factor would represent a net average result of total spins similar to the modeling of mass or charge as single points. The factor would be placed with a mass in

the inverse-square law for gravity or the charge in Coulomb's law. Two multiplying charges or masses would add the Euler exponents, but regardless those products would be dismissable as only $\pm\ 1$.

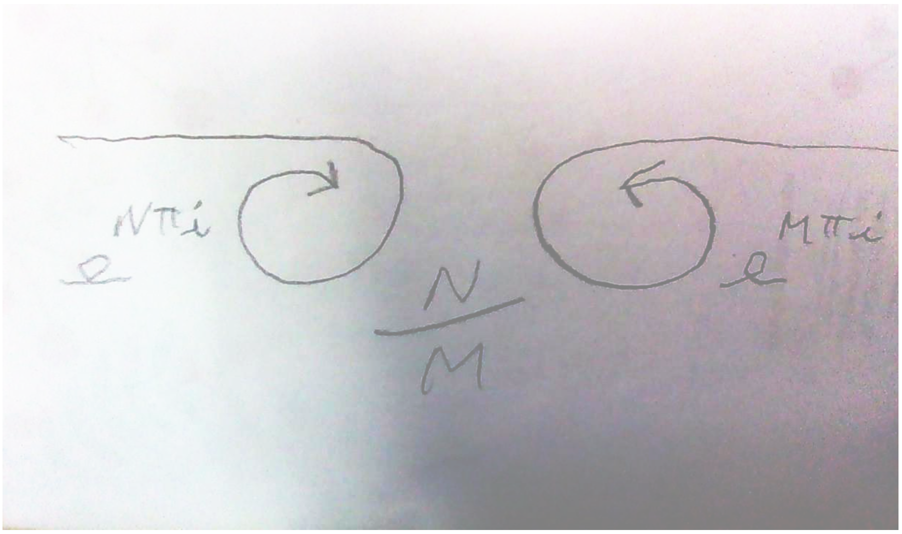

Figure 7

What would explain a single field inverse-square law could be the relative values of n-spins in any interacting pair of charges or masses. The greater the difference, the greater the magnitude, if another field factor were next to the single inverse-square law: e^(n/mπi) where n is the greater spin and m is the lesser spin. Also to get the other three forces, the i in e^(n/mπi) also disappears as just a positive one to be ignored. The same inverse-square law could scale up or down to make any magnitude, including the four fundamental forces.

Constants G and K

For example, if we use Newton's law with constant G, then to get the other three forces it looks like:

$$F = e^{(n/m\pi i)}\, G\, \frac{\underline{e^{(n\pi i)}M_n\, e^{(m\pi i)}M_m}}{d^2} \quad \text{or} \quad F = e^{(n/m\pi)}\, G\, \frac{\underline{M_n\, M_m}}{d^2}$$

If on the other hand we use Coulomb's law with constant k, then to get the other three forces it looks like:

$$F = e^{(n/m\pi i)}\, k\, \frac{\underline{e^{(n\pi i)}Q_n\, e^{(m\pi i)}Q_m}}{r^2} \quad \text{or} \quad F = e^{(n/m\pi)}\, k\, \frac{\underline{Q_n\, Q_m}}{r^2}$$

Whichever inverse-square law we used as our starting base, when the n/m ratio equals one then the i would be working to make the outside factor also only ± 1. Or at least we will treat it as so. It could be that the expression is still working without i, giving e^π which is roughly equal to 23. This factor of 23 may be contained in both constants G and K such that it would be a hidden value which is actively used. We shall see in Table 3 that there is not much use in having the outside factor with Coulomb's law if we are interested in finding spin values.

If there is a single inverse square relation then there should also be just a single constant to go with it, which now manifests as two separate constants, the gravitational G and the electrical K:
G = 6.7 x 10^-11 N m^2 / kg^2   rounding the numbers roughly, and
K = 9 x 10^9 N m^2 / Q^2   writing coulombs as charge Q
As another section explains, we shall use 10^36 as the order of magnitude difference between gravity and electricity, which works out to 27.4 relative n/m spins. This may be a hidden variable, but its observational result is to change not only the forces but the values and magnitudes of the constants when measuring charge instead of mass. The relative magnitude difference between constants K and G is:
K/G = (9 x 10^9) / (6.7 x 10^-11)
which equals 1.34 x 10^20 instead of 10^36, leaving a power of 10^16 expressed in the product of charges compared to the product of masses in the inverse square relation.

This is a product of charge Q times charge Q or mass times mass in kilograms. These are what is spinning, not the constant, and the relative spin whether mass or charge is a difference of 27.4. Now to divide up that 27.4 relative spins among the constant or the factors. First, how many spins make up a magnitude of 10^20. Treating both i and spin m as = 1, then:

n = (20 ln10) / (πi) = 14.66 spins' worth affecting the change in constant value from G to K.

What this means is that about half of the relative spins' force alters the value of the constant and this might be interpreted as a drag effect of (st). If this drag effect varies by the spins' force then we could posit hypothetical constants for the strong and weak forces by similarly taking half of their relative spins. A later section gives the value for strong spins as 29 and weak spins as 19.3. Let us then say that 15 strong spins and 10 week spins have their force diverted into constants. We can now solve for the magnitude difference from the gravitational G.

For the strong spins we get:

15 = (Xln10) / (πi) so then 15πi/ln10 = X magnitude, ignoring i

Then X = 20.5 rounded, so the magnitude difference is 10^20.5

Then the constant's force is (10^-11)(10^20.5) = 10^9.5

For the weak spins we get:

10 = (Xln10) / (πi) so then 10πi/ln10 = X magnitude, ignoring i

Then X = 13.6 rounded, so the magnitude difference is 10^13.6

Then the constant's force is (10^-11)(10^13.6) = 10^2.6

This does make an orderly progression in the value of constants from 10^ -11 to 10^2.6 to 10^9 to 10^9.5 and presumably as N m^2 / Q^2 for all except G.

Quantum unit basis

One way to get a real value of n is to use quantum theory and Planck's constant h. Combining E=hF and E=MC^2 makes MC^2=hF which gives the frequency F= MC^2/h for a matter wave. If we put in the numbers for the reduced constant h and the Planck mass then we get:

2.18X10^-8 (3X10^8)^2 / 1.05X10^-34 = 18.6857X10^42 = 1.8X10^43

This is the Planck frequency in Hz for the upper bound of electromagnetic or cosmic rays. Since this is the highest possible frequency, it can represent the strongest force of nuclear binding.

To be consistent with the Heisenberg uncertainty principle, the smallest spin radius should be the Planck length when we interpret the uncertainty principle as angular momentum.

Orders of Magnitude Table

The next table will show the relative spin-cycle n values for each force and also their characteristic frequencies:

Force	Magnitude	Frequency Hz	Relative n/m	Relative n/m
strong	1	10^43	29	2.5
electromagnetic	10^-2	10^41	27.4	1
weak	10^-13	10^30	19.3	-7.1
gravity	10^-38	10^5	1	-25.4

Table 3: Relative Comparisons

The characteristic frequencies for electromagnetic and weak force are beyond the high gamma range. Since gamma rays are part of radioactivity emissions this is not too surprising for the weak force. It is more surprising that it would be the basis of charge Q. Gravity does give a good fit merely by subtracting exponents, though of course gravity waves are not electromagnetic waves. This 10^5 frequency could be the actual angular speed of a single-n spin speed.

A prior calculation of relative spins used forces magnitudes for the gravity field G and the electromagnetic field Q the ratio or fraction Q/G equaled 10^36. Both fields were treated as if they were single spins instead of spins of pairs. With G set as just one spin, then the value of Q's Euler factor's n is 27.4 or 27 and a half spins.

For the frequency column in the table we retain the Planck frequency as the highest possible value for the strong nuclear force and then adjust the other frequencies accordingly based on the declines in magnitude. Spin values for strong and weak forces are recalculated in the same manner as above:

Solving for the strong n we get:

$n = (38 \ln 10) / (\pi i) + 1 = 27.8515527574 + 1 = 29$ spins

Solving for the weak n we get:

$n = (25 \ln 10) / (\pi i) + 1 = 18.323389972 + 1 = 19.3$ spins

The final column in the table shows the impracticality of using Coulomb's law to define a spin as n equals one. If we do that we get negative spin values for the lesser forces because the starting fractions had the greater charge value in the denominator: weak/Q and G/Q.

Spin Range Spectrum of Forces

Changing the spin value will accordingly change the spectrum range of relative forces. This spectrum is based on relative spins which themselves are derived from relative magnitudes. The table 3 column of "Relative n/m" for Gravity = 1 is all we can know for the spectrum range of relative forces since a relative spin necessarily involves both masses or charges in the inverse square law. The forces spectrum may then define as:

Gravitic: 1 to 10, weak: 10 to 19, electromagnetic: 19 to 27, strong: 27 to 29 or?

How the force is defined would depend upon the context of measurement. More subtle distinctions of spin ranges may divide the spectrum into more forces than just the fundamental four, depending on what we observe and discover.

Evidence of Right Hand Rule

Features of Maxwell's equations should show up on a larger or smaller scale if there is really only a single inverse square law. The intensity of electromagnetic behavior would be attenuated on a larger gravitic scale or increased in an atomic orbital or nuclear scale. An easy place to look for obvious evidence of this could be if planetary orbits or other stellar motion might fit the right hand rule. For example, the planets of our solar system roughly conform to paths which rotate counterclockwise when viewed from the sun's North Pole. This would make the path of the sun itself a current flow (fig. 8).

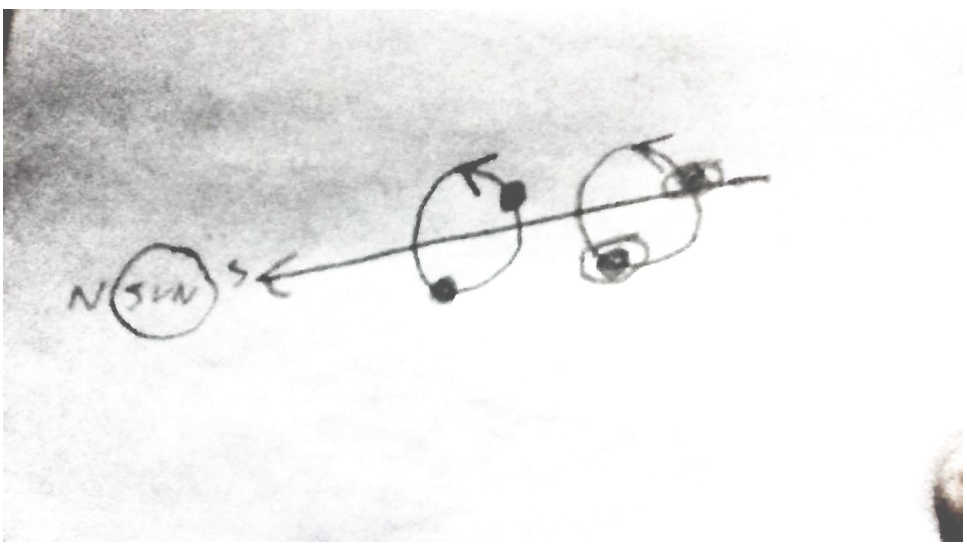

Figure 8

If we compare fig 8 above to fig 5 we see that the sun itself would have to be one of the spinning attractors in the pair for fig 5. The resultant vector flow in fig 8 is no longer in the upward direction because the pairs are now stacked in the third dimension along the axis of current flow. Anti-gravity would make a left hand rule moving away from the Sun.

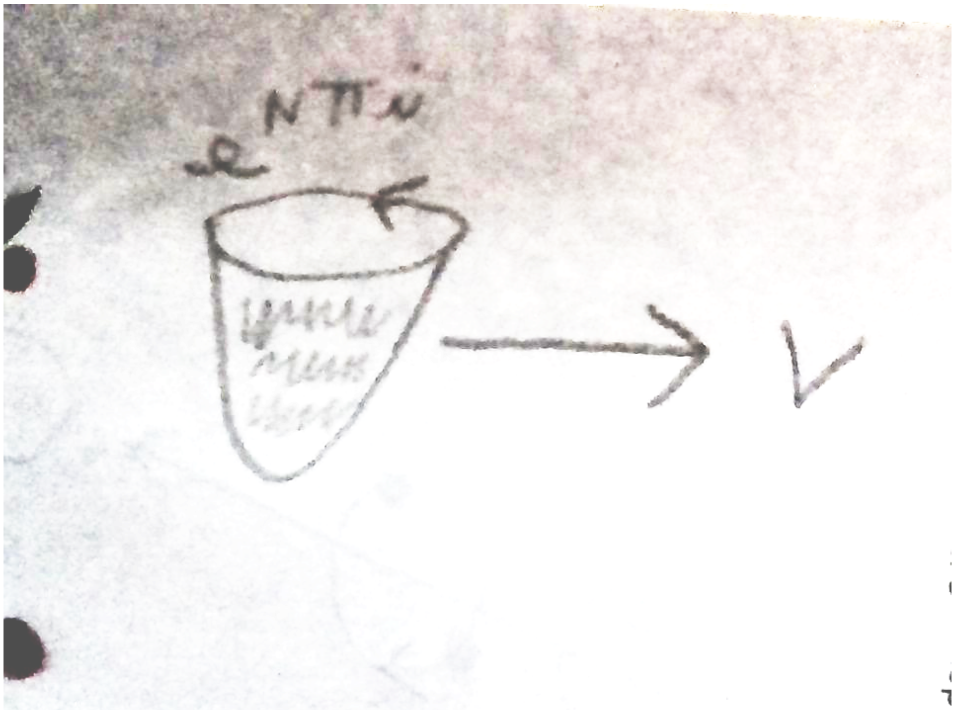

Figure 9

5. Some Principles

Conservation

To help clarify the difference between spin-n-values in the table and Hertz frequencies I will make an analogy as the child's toy of a spinning top on the ground, only instead of the typical wooden top with a metal post let us imagine it as a hollow plastic top (fig. 9). Of course the spinning of the top is the (st) spin of enfielding which continues as long as it has mass in the traditional sense. As it spins it is also moving along the ground In some kind of path, and this is the inertial velocity of a fielded mass, or the current flow of a charge. Within the hollow plastic top there could be waves or particles vibrating around, and these would be the characteristic wave functions of electromagnetic photons or larger mass particles, $\lambda f < C$ now, in either case what could be called a wavicle. We do not want to violate relativity, so from any point of view the total velocity should never exceed the speed of light. This leads to a conservation of velocity principle implicating the speed of light:

$\Sigma v = c$ Or the sum of all velocities adds up to the speed of light C.

If this were so, then we might find some further relations between the quantum equation and the Euler field factor:

E = nHf = MC^2 = M(inertial v + λf + n-spins speed)^2

This assumes that wavelength λ times frequency f and the n-spins speed are not one and the same thing, which they might be. Here the spin unit n is part of the exponent of the Euler factor e^(nπi) where, once fielded by e^(πi), any further rotation by n spins makes the vortex effect in (st) to give field strength and matching to any of the drawings presented in this and the previous paper. A better analogy than vortex would be like a fishing line reel that increases tension as it is wound up. This is a new property of space-time.

The Meaning of ½

Let us return to our starting point of E=MC^2 or E equals MC squared.This is defined as the ultimate potential energy or if all of the energy were converted into actual kinetic energy of MV^2 where V here is C. So one has to ask: where is 1/2 since the usual definition of kinetic energy is 1/2 MV^2 not just MV^2. This facilitates taking a calculus derivative so that the derivative of 1/2 MV^2 by the exponent rule becomes MV momentum. In unfielded (st) SpaceTime the unfielded momentum is defined as MC so if we use calculus then the ultimate kinetic energy would not be MC^2 but it should be 1/2 MC^2. Relativity seems to give us twice as much potential energy as basic math would. We need to find a property of (st) enfielding that accounts for the missing one half factor. A clue to that has already turned up in the discussion of force constants where we see that about 1/2 of the spins get absorbed into the constant. Just from the act of enfielding, as figure 10 shows, when a photon is enfielded its momentum is multiplied by C and when it is unfielded its energy is divided by C. Because of the one half drag factor from (st) the unfielded MC becomes the kinetic energy of 1/2 MC^2. When this kinetic energy is unfielded back into (st) momentum then the derivative naturally becomes MC. So we can still use basic calculus:

½ d/dt MC^2 = ½ (2) MC = MC or = MC^2 divided by C

Why is there multiplication or division by C to represent energy and momentum conversion from fielded to unfielded? Recall again that as figure 10 shows (st) can be represented by a C-by-C Cartesian grid and the act of enfielding is represented by an Euler i-spin headed in a pi/2 angle, so we get coordinates multiplying as if to make an area or curl activity.

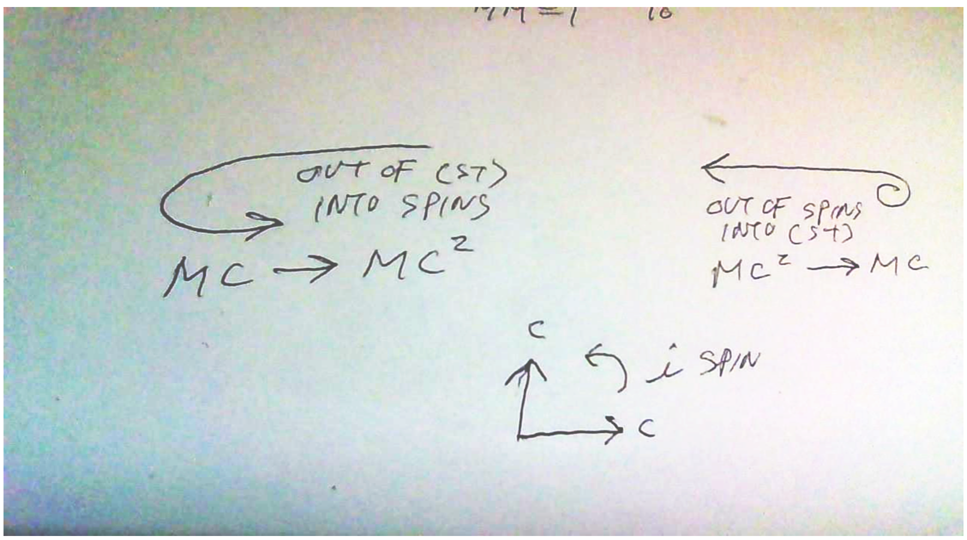

Figure 10

Frequencies or Not, Darkness

Up to now there has been a mystery about just what the actual frequencies of any spin cycles could be in the real world. There is an obvious answer which presents itself and which requires further revision or extension of these ideas. If we recognize that a spinning photon is a cyclical behavior then we may as well assign it the known hertz frequencies of the electromagnetic spectrum for any one second snapshot. Unfielded photons traveling at MC without spin could be the hard cosmic rays. And when a photon

is fielded into matter we still have the drag effect of losing one half of its spins to go through the process of enfielding. Other known spin frequencies of any matter could be any established frequencies such as Schrodinger waves or other matter waves. The wave-like behavior of a wavicle is now identified as a spinning particle.

Accordingly, the table of relative frequencies can be revised again to include the new matter and energy possibilities while preserving the known observed magnitudes as parts of a broader range:

Force	Magnitude	Fielded Hz	Relative n/m	Unfielded Hz
strong	1	10^21 – 10^43	29	? (same?)
electromagnetic	10^-2	10^4 – 10^20	27.4	10^4 – 10^20
weak	10^-13	10^4 – 10^9	19.3	? (same?)
gravity	10^-38	10^0 – 10^3	1	? (same?)

Table 4: Visible Matter and Energy

On the other hand a possible explanation of dark matter and energy also presents itself. In the unfielded state of moving at MC perhaps dark energy is merely photons moving without spinning and thus no observable frequency. To explain dark matter, let us use a simple definition of what makes something fielded in the first place. Given the conservation of light velocity C, if a photon-particle is pursuing a relatively straight path at C velocity then it is unfielded in basic SpaceTime. To be fielded means that its straight path has been diverted into an endless circling upon itself. To conserve the velocity C yet have no extra spinning which would be identified as a hertz frequency, if the endless circling can only be spinning then what makes dark matter is that all of its C velocity is converted into spin, leaving nothing for emission. Any n/m spin ratio comparison would result in a very strong force. In short, we have four basic

possibilities: unfielded spinning is visible energy, unfielded not spinning is dark energy, fielded spinning is visible matter, and fielded total spinning is dark matter. This can be Illustrated as a spin spectrum in Figure 11:

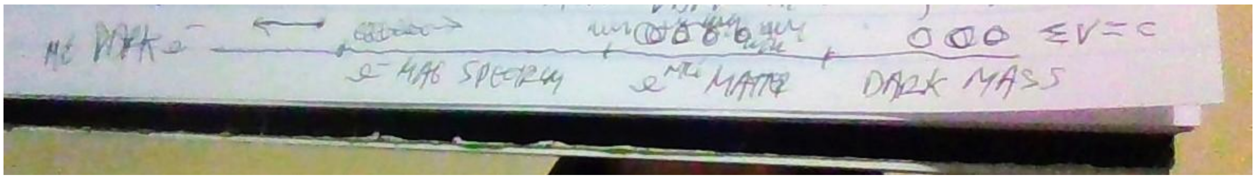

Figure 11

Wave Ranges

An interpretation of wavicles or electromagnetic waves using the conservation law of light velocity is possible. Looking at Figure 12 we see a standard depiction of how a circular motion of a particle on the edge of a circle will describe a classic wave pattern if the center of the circle moves in a straight line. If one complete wavelength lambda or λ is accordingly the circumference of the circle, and since π or pi Is defined as the ratio of the circumference to the diameter, then the radius equals $\lambda / 2\pi$. Such radii are too large to be actual particles but they could easily belong to the field ranges from the corollary principle of range R times velocity V equals the speed of light, RV = C. The velocity in this situation is the hertz frequency Hz of the wave and the range factor itself takes on the unit label of distance so we have RHz = C. Recall the definition of a light wave where frequency times wavelength equals C, or λHz = C. Then the range R equals the wavelength and the wavelength is 2 pi radius so R = 2πradius.

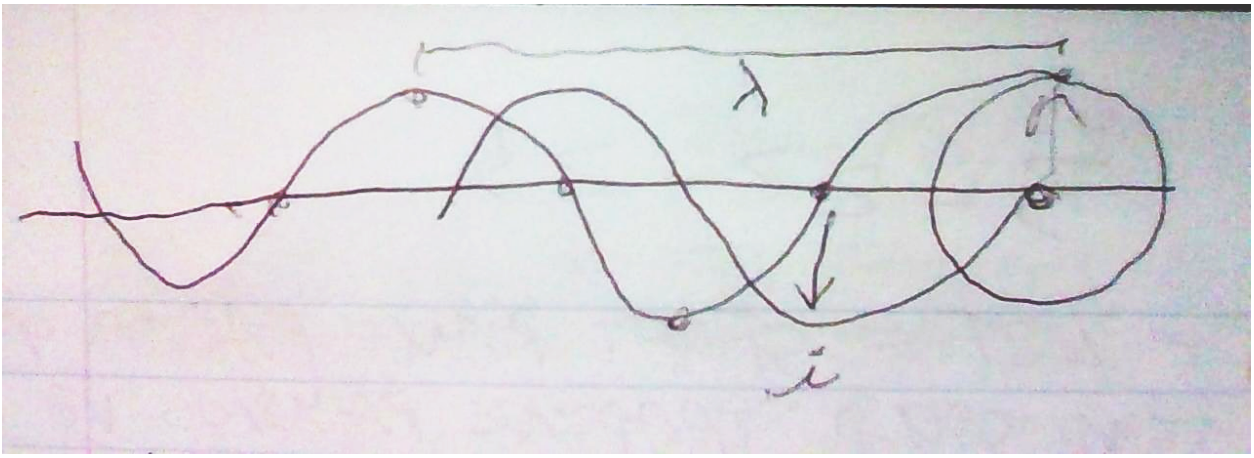

Figure 12

Consider the center of the circle in the figure as a photon and the radius of the circle would be the photon's field range if it were not moving in a straight path. Forward spin of the range makes the wavelength Lambda and the sidewise i-spin makes the shift from electric to magnetic force, giving the right-hand rule. We get another corollary principle out of this due to the magnetic and electric ranges complementing each other such that as one is increasing the other is decreasing or vice versa. The principle is: electric and magnetic wave heights, or ranges, at any spot on the linear path would add up to the amplitude radius, the basic field range. So the field range is corkscrewing along a straight path, alternating in electric and magnetic directions.

If the wavelength is a linear range yet the radius itself would be a spinning range what is the implication for their differences in magnitude? Given λHz = C and thus 2πradiusHz = C then radiusHz = C/2π which is a constant. Now consider the conservation principle where all velocities in an inertial frame of reference add up to C. If radV=C then rad=C/V and so 2πradiusHz = 2πHzC/V = C and then 2πHz/V = 1 or 2πHz = V which is the formula for angular velocity. Why has our linear velocity V become a Hertz frequency? Because it has undergone an i-spin into alternating electromagnetic wave behavior, so it is really 2πiHz = V. Now recall that 2πi has part of the EFF Euler field factor e^nπi, and e^2πi = (e^πi)^2 = (-1)^2 = 1 so what would be an endlessly spinning

fielded range resumes a straight line path only now it is spinning in wave-like behavior. So then when we have radV = C we get instead rad2πHz = C which is λHz = C.

Some further definition is now needed as to what makes a field or not. Our single field has now taken up electromagnetic energy waves which were originally considered as unfielded. The distinguishing feature of unfielded remains as mainly straight-line motion in a CXC Cartesian spacetime grid which results in the Lorentz transform factor for the range component upon fielding into circular i-spin behavior. Linear paths can still be altered by gravity as with general relativity. One difference from usual assumptions is that the magnetic and electric waves are out of sync, to give an explanation of the right hand rule. This could be such a slight difference that it may be undetectable; it at least has an abstract mathematical appeal. If the sync difference is π/2 radians then that would correspond to the meaning of i as a right angle rotation. In this case i is a factor upon the electric wave to spin it into the magnetic direction.

We might also ask how can an unfielded photon in a straight line path be given an i-spin yet that does not take it all the way into an Euler spin and thus halt its straight line direction to become fielded? Note that we may label the photon's path as the X direction whereas the i-spin would be in the YZ plane, and fielding would include the X direction in any spinning. Perhaps the threshold for becoming fielded, aside from the plus or minus-one collision rules, is if the i-spin tries to go beyond the known upper limit of the electromagnetic spectrum. So adding energy to a photon by increasing its frequency could lead it to become material, so we could expect the reverse to happen by lowering the spin of matter to get energy out of it by photon emission. We would then be reading the spin spectrum from right to left (fig. 11).

More Consequences: Sums Versus Range

To avoid inconsistencies some further mathematical results arise in consideration of a principle of conservation of light velocity versus the idea of a field range also guaranteeing the velocity of light for a single particle. From an absolute point of view or

POV we have the conservation principle of: the sum of all velocities must add up to C, or $\sum$ V = C. However for an individual particle whether photon or fielded mass the degree to which its velocity is less than C has a field range factor R such that RV = C where R can be dimensionless as R = C/V or it can give a field range if we shift the distance label from V to R itself. But if a particle's total velocities make C then how could there be a range for a sub-light V? The ranges occur for an isolated POV context instead of the aggregated total absolute POV. Now let us put all of these single POVs into the total POV and we will have some new results:

If RV = C then V = C/R and if $\sum$ V = C then $\sum$ C/R = C which means that:

C $\sum$ 1/R = C and therefore $\sum$ 1/R = 1 so that the reciprocals of all of the isolated ranges add up to one. Of course in an infinite universe of infinite particles any practical summation would be countably impossible and a more accurate result would come from an approach akin to gas laws. Or if we consider further away sources irrelevant or inconsequential then we may focus on a few ranges and velocities getting very close to C or one, and then perhaps we could do some calculations.

Aside from this another paradoxical question arises: if all of the sums add up to light speed for any POV then there would be no leftover velocity deficits to make a range R in a field for any moving particle, RV=C. If we took each individual velocity apart from the total sum and computed its field range and then added up all of those ranges with their field effects, Σ R, this could comprise the untapped potential vacuum energy which is speculated to exist in a quantum foam. In general we could say that the

$\sum V$ = (inertial speeds) + (Euler spins) is analogous to the sum of kinetic energy plus potential energy.

Such energies require pairs of masses interacting, or of mass and photons, and this could be the key to keeping the two kinds of conservation principles separate and compatible. For a totally isolated single enfielded mass then we have the principle of the sum of the V's equals C. When two particles are interacting according to the inverse square law then we are only considering a single velocity of their relationship and each particle is pulled away from a pure velocity of C, thus creating the field range as the deficit space-time tension. We may still ask what may have been the original Force that pulled or pulls everything apart in the first place. So far no particular interpretation is favored: big bang, quantum foaming, steady state flux, vibrating branes, vacuum energy, etc.

The particular interpretation that is favored is that the enfielded sums $\sum V = C$ can only appear as a general principle which is perhaps most closely approximated by dark matter with its self-contained spin, yet even that mass exerts gravitational force on other objects. Even a visible light ray has a tiny range of VR=C in the wave amplitude yet there is no necessary paired object to exert an inverse square force.

Simultaneity

A single field approach has an efficiency over classical and modern theories in that it does not partake of what could be called a simultaneity principle, in which different fields of force are acting upon the same things at the same time. In standard physics an atom has strong and weak forces and electromagnetism and gravity compared to any other atom. Standard UFTs try to combine these separate forces into a single framework yet retain their separate simultaneous activity. A single field means that any pair of

interacting objects only has one force occurring, which can manifest as strong weak electromagnetic or gravity depending on the context. This is how standard physics models behavior anyway, but it maintains the unspoken assumption of a simultaneity principle which would just be irrelevant difficulty for calculations. With a single field the universe should still hold together as it really does. There is a new type of simultaneity in which any paired objects have one field strength but the same object can simultaneously have a different field strength if it is part of a different pair.

Figure 13 below illustrates why gravitation can be universal in spite of single field interactions between pairs. Say that point pairs AB have the same n/m spin ratio as the pair CD far across the universe, outside of their field range of c/v for any single point. Then AB are not directly attracted to CD. AB do match to point E within range, so these share a field. E shares a different n/m ratio with point F and their own field range. The process continues endlessly to points G,H, … eventually matching to CD sharing an n/m ratio of one which is gravity strength. Given overlapping fields, CD is indirectly attracted to AB. Apparently when all of these uncountable interactions are averaged out we arrive at Newton's constant G which is still used in general relativity.

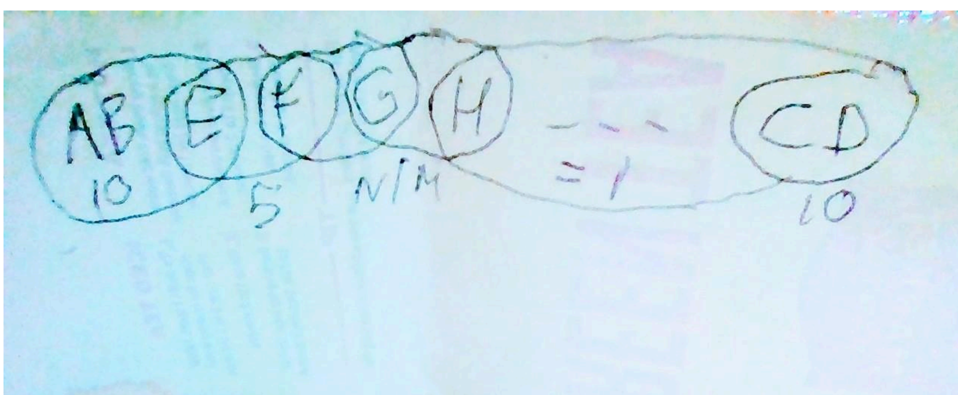

Figure 13

Complete UFT Equations, A Nested Approach

With the mathematical basis now completed, we can make a UFT by revising the extant separate equations into a single nested system, avoiding the 100-year-old problem of trying to unify separate forces. The overall approach is to nest Euler's equation into Newton's equation into Maxwell's equations into Einstein's equations. The common solution to the system becomes the spin ratio n/m which scales forces up or down based on a single field.

As noted in a prior section, the Euler field factor EFF begins with placement next to Newton's constant G. This substitutes into Coulomb's law for an equivalent to constant K. This can also appear in the general relativity equations in the one spot where G does, merely placing the EFF as the hidden variable factor next to Einstein's gravitational constant which uses Newton's G:

$$e^{(n/m\pi i)} \frac{8\pi G}{c^4} T_{uv}$$

General relativity's space-time now has an EFF-G that, through Coulomb's law implied by the first Maxwell equation, brings Maxwell's four equations onto (st), manifesting in the orbital results also noted in a prior section on the right hand rule.

Earlier it was said that half of the relative spins' force alters the value of the constant and this might be interpreted as a drag effect of (st). Yet, starting with gravity the value of the constant is the basis of field strength. From mass in kilograms to charge Q there is still a 10^{16} force difference beyond their constants' Newtons. That can be interpreted as a current flow of that many masses or as due to the n/m spin ratio. When single point interactions such as atomic structure are considered, n/m spin ratio does provide an explanation.

Here our speculation is at an end, for now.

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